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MEMORANDUM

Subject: Evaluation of the E. I. du Pont de Nemours and Company DeLisle Facility's status under the RCRIS Corrective Action Environmental Indicator Event Codes (CA725 and CA750)
EPA I.D. Number: MSD 096 046 792

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I. PURPOSE OF MEMO

This memo is written to formalize an evaluation of the E. I. du Pont de Nemours and Company's DeLisle (DuPont) facility status in relation to the following corrective action event codes defined in the Resource Conservation and Recovery Information System (RCRIS):

- 1) Human Exposures Controlled Determination (CA725),
- 2) Groundwater Releases Controlled Determination (CA750).

Concurrence by the Branch Chief is required prior to entering these event codes into RCRIS. Your concurrence with the interpretations provided in the following paragraphs and the subsequent recommendations is demonstrated by dating and signing above. See Memo Attachment 1 for more specific information of the RCRIS definitions for CA725 and CA750.

II. HISTORY OF ENVIRONMENTAL INDICATOR EVALUATIONS AT THE FACILITY

This particular evaluation is the first evaluation performed by the U.S. Environmental Protection Agency (EPA) Region 4, for the DuPont Facility located in DeLisle, Mississippi. The evaluation, and associated interpretations and conclusions on contamination, exposures and

contaminant migration at the facility, is based on information obtained from the following documents:

- 1) RCRA Facility Assessment, March 1996;
- 2) Confirmatory Sampling Investigation Report, November 1997;
- 3) RCRA RFI Work Plan, May 1998; and
- 4) Confirmatory Sampling Groundwater Investigation Report, June 1998.

III. FACILITY SUMMARY

DuPont owns approximately 2200 acres in DeLisle, Mississippi on which it operates a titanium dioxide manufacturing facility with two identical production lines. The manufacturing facility is on a developed area of approximately 200 acres (see location maps). The facility has been operating since 1979. Prior to that time, the land was undeveloped. DuPont manufactures approximately 250,000 tons/year of titanium dioxide product which is a white pigment used in plastics, paints, textile fibers, as a food additive, and in many other materials that require whiteness, brightness and opacity (the resistance to light passing through an object). The pigment is produced by processing ilmenite ore to separate titanium dioxide from other metal oxides. Then the titanium dioxide is further processed to impart the desired properties for specific uses.

Two main waste streams are generated in the production process. One is the iron chloride solution, an acid wastewater which is considered a “characteristic” hazardous waste due to the low pH; and, the other waste stream is a “white water stream” which is non-hazardous. In addition, The white water stream is managed by on-site treatment and discharged through an MDEQ issued National Pollutant Discharge Elimination System (NPDES) Permit. The iron chloride solution is managed by separating out the solids which are recycled back into the process. The remaining iron chloride solution is then stored in a storage “vault” to disposal.

In 1996, the RCRA Facility Assessment (RFA) was conducted to identify solid waste management units (SWMUs) and areas of concern (AOCs) and to evaluate their potential for release of hazardous waste or hazardous constituents to the air, surface water, soil and groundwater. The RFA identified 48 solid waste management units (SWMUs) and three areas of concern (AOCs). Of these, 18 were recommended for soil and groundwater sampling and are being investigated through the field work conducted during July and August 1998.

IV. CONCLUSION FOR CA725:

The media specific pathways such as groundwater, soil, surface water and air are currently being evaluated to determine whether human exposures to contamination are controlled. Specifically, for human exposures to contaminated media listed above, it cannot be said that there is no potential for exposure because there are limited soil and groundwater sample results. As stated above, DuPont is conducting soil and groundwater sample collection, analysis and evaluation through the format of a RCRA Facility Investigation during the summer of 1998 and a Draft RFI Report will be prepared and submitted to both the EPA and MDEQ project managers.

At present, there is not enough data to draw a conclusion as to whether human exposures to contaminated media is controlled. Therefore, for this first evaluation of the DuPont facility with respect to human exposures controlled, the RCRIS Code **CA725 is IN**.

[Note: See Memo Attachment 2 for a detailed discussion supporting the above conclusion.]

V. CONCLUSION FOR CA750:

As discussed in Section IV above, all the media specific pathways are being evaluated based on existing information in order to determine whether groundwater contamination exists and if it is controlled (site-wide). Based on the discussions in Memo Attachment 2, it can be concluded that releases of several metals to groundwater have occurred. However, there is not enough quarters of groundwater monitoring or soil sampling data to make a determination that control measures or corrective action are required at this time. Therefore, for this first evaluation with respect to whether groundwater contamination exists and is controlled, the RCRIS Code for **CA750 is IN**.

[Note: See Memo Attachment 2 for a detailed discussion supporting the above conclusion.]

VI. SUMMARY OF FOLLOW-UP ACTIONS

There are several simultaneous field investigations and monitoring activities in progress at DuPont. First, there was confirmatory soil sampling conducted at several SWMUs and from that investigation, it was determined that releases to the soil and possibly groundwater had occurred. These SWMUs/ AOCs were moved into the RCRA Facility Investigation (RFI) for further evaluation. Secondly, there was confirmatory sampling for groundwater at several SWMUs or AOCs. Quarterly groundwater samples were collected from July 1997 through July 1998. From a review of the analytical data, it was determined that RCRA metals had been released to the groundwater, in concentrations at or just above residential health based risk concentrations which are used as "action" levels. DuPont proposed, and the EPA and MDEQ concurred, that an additional four quarters of data are needed to determine whether there are any trends developing. Lastly, this summer DuPont is conducting the previously mentioned RFI to determine the extent of contamination to soil and groundwater. During July and August of 1998, fieldwork was completed to replace the temporary groundwater monitor wells with permanent ones, to collect additional soil samples, and to determine the three dimensional extent of contamination at areas where releases have been identified.

The RFI Report is due to be submitted by the end of the calendar year 1999. Until the report is received and reviewed, the only specific information available is that metals such as arsenic (possibly from the application of herbicides to control unwanted vegetation), barium, beryllium, chromium and lead, to name just a few, are present in the surficial soils at levels just

above the detection limits. And, there is limited data that suggests that some of these same metals have been detected in the groundwater.

After the soil and groundwater sample collection is completed the laboratory will analyze the samples and report the findings to DuPont. Then, the DuPont environmental team will evaluate the data and submit a Draft RFI Report to the EPA and MDEQ project managers. The RFI Report will present the evaluation of the data from the units being investigated, provide discussions on the source and extent of the releases and contain recommendations to select and implement appropriate corrective action.

Attachments (4)

1. Memo Attachment 1
2. Memo Attachment 2
3. Location Map
4. Topographic Map

ATTACHMENT 1

A. HUMAN EXPOSURES CONTROLLED DETERMINATION (CA725)

There are five (5) national status codes under CA725. These status codes are:

- | | | |
|----|----|---|
| 1) | YE | Yes, applicable as of this date [i.e., human exposures are controlled as of this date]. |
| 2) | NA | Previous determination no longer applicable as of this date. |
| 3) | NC | No control measures necessary. |
| 4) | NO | Facility does not meet definition [i.e., human exposures are not controlled as of this date]. |
| 5) | IN | More information needed. |

The first three (3) status codes listed above were defined in January 1995 Data Element Dictionary for RCRIS. The last two (2) status codes were defined in June 1997 Data Element Dictionary.

Note that CA725 is designed to measure human exposures over the entire facility (i.e., the code does not track SWMU specific actions or success). Every area at the facility must meet the definition before a YE or NC status code can be entered for CA725. The NO status code should be entered if there are current unacceptable risks to humans due to releases of hazardous wastes or hazardous constituents from any SWMU(s) or AOC(s). The IN status code is designed to cover those cases where insufficient information is available to make an informed decision on whether or not human exposures are controlled. If an evaluation determines that there are both unacceptable and uncontrolled current risks to humans at the facility (NO) along with insufficient information on contamination or exposures at the facility (IN), then the priority for the EI recommendation is the NO status code.

In EPA Region 4's opinion, the previous relevance of NA as a meaningful status code is eliminated by the June 1997 Data Element Dictionary's inclusion of NO and IN to the existing YE and NC status codes. In other words, YE, NC, NO and IN cover all of the scenarios possible in an evaluation or reevaluation of a facility for CA725. Therefore, it is Region 4's opinion that only YE, NC, NO and IN should be utilized to categorize a facility for CA725. No facility in Region 4 should carry a NA status code.

B. GROUNDWATER RELEASES CONTROLLED DETERMINATION (CA750)

There are five (5) status codes listed under CA750:

- 1) YE Yes, applicable as of this date [i.e., groundwater releases are controlled as of this date].
- 2) NA Previous determination no longer applicable as of this date.
- 3) NR No releases to groundwater.
- 4) NO Facility does not meet definition [i.e., groundwater releases are not controlled as of this date].
- 5) IN More information needed.

The first three (3) status codes listed above were defined in January 1995 Data Element Dictionary for RCRIS. The last two (2) status codes were defined in June 1997 Data Element Dictionary.

The status codes for CA750 are designed to measure the adequacy of actively (e.g., pump and treat) or passively (e.g., natural attenuation) controlling the physical movement of groundwater contaminated with hazardous constituents above relevant action levels. The designated boundary (e.g., the facility boundary, a line upgradient of receptors, the leading edge of the plume as defined by levels above action levels or cleanup standards, etc.) is the point where the success or failure of controlling the migration of hazardous constituents is measured for active control systems.

Every contaminated area at the facility must be evaluated and found to have the migration of contaminated groundwater controlled before a "YE" status code can be entered.

If contaminated groundwater is not controlled in any area(s) of the facility, the NO status code should be entered. If there is not enough information at certain areas to make an informed decision as to whether groundwater releases are controlled, then the IN status code should be entered. If an evaluation determines that there are both uncontrolled groundwater releases for certain units/areas (NO) and insufficient information at certain units/areas of groundwater contamination (IN), then the priority for the EI recommendation should be the NO status code.

In the EPA Region 4's opinion, the previous relevance of NA as a meaningful status code is eliminated by the June 1997 Data Element Dictionary's inclusion of NO and IN to the existing YE and NR status codes. In other words, YE, NR, NO and IN cover all of the scenarios possible in an evaluation or re-evaluation of a facility for CA750. Therefore, it is Region 4's opinion that only YE, NR, NO and IN should be utilized to categorize a facility for CA725. No facility in Region 4 should carry a NA status code.

ATTACHMENT 2

MEDIA BY MEDIA DISCUSSION OF CONTAMINATION AND THE STATUS OF PLAUSIBLE HUMAN EXPOSURES

Geology

Regionally, the DuPont site is located in the Gulf Coast Geosyncline. A syncline is a U-shaped feature like a trough. Most synclines have subsided (i.e., sunk) over a very long period of geologic time and as a U-shaped feature it received large deposits of loose sediment carried by streams and rivers which empty into the Gulf of Mexico. The strata within the Gulf Coast Geosyncline contains aquifers composed of estuarine (which means related to the ebb and flow of tidal influences, and swamps and wetlands associated with streams and rivers which discharge to large water bodies) and delta sediments (those deposited by rivers which discharge to large water bodies) that range up to 5,000 feet thick.

The site specific geology has been characterized by the 41 soil borings which were drilled to different depths from approximately seven to 100 feet below ground surface. From these soil borings and from information obtained through the drilling of the deep injection wells, it is known that there exists at the ground surface a “fill” layer that is one to 14 feet thick and consists of angular grains of sand, gravel, shell materials and some clay. Underlying the fill layer is a thick permeable silty sand unit which is the uppermost water-bearing zone and extends from approximately 14 feet below ground surface to greater than 200 feet below ground surface. In this silty sand unit, there are also discontinuous layers of clay. As contained in the Confirmatory Sampling Investigation Report, geophysical well logs indicate that below the water bearing sand unit is a confining clay approximately 100 feet thick. The first occurrence of groundwater is generally from nine to 14 feet below ground surface.

The DeLisle Plant is on land which gently slopes to the southeast toward a swampy area adjacent to the St. Louis Bay. Elevations range from approximately 90 feet above mean sea level (MSL) in the northwest portion of the site to sea level in the southeast.

Groundwater

A minimum of 15 groundwater monitor wells have been installed during the groundwater confirmatory sampling investigation and these wells are screened in the upper ten feet of the water bearing sand unit. Water level elevations indicate that the predominant groundwater flow direction is to the southeast.

Groundwater data has been collected for four quarters. Some of the quarterly data, but not all, indicates that metals such as arsenic, barium, beryllium, chromium, lead, just to name a few, have been detected in the groundwater. Also, volatile organic compounds such as tetrachloroethene have been detected in the groundwater. This was expected since there have been reported instances of product spills in the production area. The reported concentrations of these constituents was not in amounts which pose immediate threat to human health or the environment. In fact, in several instances, these constituents were detected in such low concentrations that they

were below MCLs, where present; and, some constituents were detected at concentrations which are below conservative residential health risk-based action levels.

At this time it is not possible to make a determination whether or not groundwater poses a threat to human health and the environment. The investigations being performed during the summer of 1998 will provide the necessary information to make this site wide determination.

Surface Water

There is a large surface water body, Blake Lake, located on the property. There is also a storm water management area, the Rain Basin, which is permitted to discharge to a tributary of Whitfield Blight. St. Louis Bay and associated wetlands are located along the eastern and southeastern property boundaries. Current exposure pathways considered for surface water are those that might occur from direct contact with either the process wastewater managed in the Process Sewer System or storm water runoff. The facility was issued NPDES Permit # MS0027294 to discharge treated effluent from the on-site wastewater treatment facility as well as permitted storm water discharges. At these areas soil and groundwater samples are being collected through the process of the RFI. Until all the data has been analyzed and reviewed, it is not possible to make a determination as to whether or not there is a site wide risk to human health or the environment from constituents that might be contained in surface water.

Soil

There are limited data with respect to the amount of contamination in surficial and subsurface soils. For example, at one SWMU only 15 soil samples were collected and analyzed. Several metals were detected but in very low concentrations such as at the "detection limit." Some of the metals detected are commonly occurring and may also be present in commercially available products (past and present) that are spread on the ground to control unwanted vegetation or pests.

It is unknown whether there is or is not a complete route of exposure for dermal contact, incidental ingestion or dust inhalation. Pathways considered for soil exposures include: direct dermal contact with surficial soil, inhalation of airborne fugitive dust, incidental ingestion and inhalation of any volatilized sub-surface compounds. Risks are not anticipated to be of concern through soil for all routes. However, as previously stated, there are areas in the manufacturing process areas where soil investigations are currently being conducted. At this time it is not possible to make a determination as to whether there are [soil] exposure risks to human health or the environment.

Air

At the DuPont DeLisle plant, the possible routes of exposure for air contamination exist from an exposure to a fume cloud release from a process equipment leak, exposure to fumes from

paint and/or solvent fumes from maintenance activities and/or new construction, exposure to fumes from paint generated during batch quality control tests, or exposure to fumes in the laboratory.

For air emissions from the manufacturing operations, DuPont was issued Clean Air Act Permit #1020-00115 for emissions from the production of titanium dioxide. Contingency plans exist for accidental releases of chlorine gas which is stored and used in the process and is a potential air risk. In addition to the chlorine gas, there is the possibility of an accidental fume release of titanium tetrachloride from the manufacturing process. As a safety measure for all types of fume releases, DuPont conducts weekly safety drills and visitors to the plant receive portable respirators and emergency instructions for reporting to a personnel counting station.

The primary air pathway of concern is an accidental fume release. With respect to the air pathway and the RFI that is currently being conducted, the air pathway is not reasonably expected to be contaminated from releases which may have occurred at either solid waste management units or areas of concern. However, prior to a final determination, the potential for exposure risks as a result of releases from the units just mentioned are currently under investigation.